REMARKS/ARGUMENTS

The drawings stand objected to because reference characters 16a, 18a and 20a in FIG. 1 do not point to the proper apertures of the grids Enclosed herewith is a revised FIG. 1 which has been marked up in red indicating which apertures in the G3, G4 and G5 grids the reference characters 16a, 18a and 20a respectively designate. The drawings also stand objected to because the "Eb source" in FIG. 2 is designated by reference number 62, while in the specification on page 11, line 9, the Eb source is designated by element number 94. The specification on page 11, line 9, has been amended to refer to the Eb source as element number "62", rather than "94" for consistency with FIG. 2. Finally, an informality has been corrected in the specification on page 1, at line 14.

Claim 14, line 4, has been amended to recite "a single common aperture" to provide antecedency for recitation of this term later in the claim. Claim 15, line 6, has been amended to change "or ore" to read "or more".

Claims 1-12 stand rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,339,293 to Kimiya et al. Claims 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kimiya as applied to claim 1, and further in view of U.S. Patent No. 5,055,749 to Chen et al.

Applicants' invention is directed to an improved electron gun for a monochrome or color cathode ray tube (CRT) having progressively reduced electron beam passing aperture size within its electrostatic focusing lens. The electron gun includes plural aligned charged grids each having an aperture (in a monochrome CRT) or plural apertures (in a color CRT) through which an electron beam (or beams) is directed. The beams emitted by a cathode sequentially transit a beam forming region (BFR), a dynamic focus lens and a main focus lens prior to being incident on the CRT's display screen. The electron beam tends to expand in diameter as it travels in the direction

of the CRT's display screen due to the velocity of the electrons along the R-direction (which is transverse to the electron gun' s longitudinal Z-axis), as well as to the space-charge effect in the beam caused by the mutual repulsion between the electrons in the beam. This results in an increase in the focusing effect on the electron beam of the electron gun's grids in proceeding from the BFR toward the display screen where the beam passing apertures in the various grids are of the same size. By providing the electron gun's dynamic focus lens with progressively reduced electron beam passing aperture size in proceeding toward the electron gun's cathode, increased electron beam focusing sensitivity is realized without increasing the dynamic focus voltage or electron beam spot aberration on the display screen. Thus, it is a progressively reduced electron beam passing aperture size within the various grids in the electron gun's electrostatic focus lens in proceeding toward the electron gun's BFR which is the essence of Applicants' invention and which distinguishes the claimed invention from the cited prior art.

The Examiner relies upon the '293 patent to Kimiya as disclosing an electron gun for a CRT which includes an electrostatic lens disposed intermediate a BFR and a display screen and including plural second grids, where the Examiner specifically refers to an upper part of grid 3 and grids 4 and 5, as shown in FIGS. 7A and 7B and described in column 6, lines 53-65. The Examiner specifically relies upon Kimiya in its use of these second grids having one or more second aligned apertures through which an electron beam is directed, wherein the second aligned apertures decrease in size in proceeding in a direction from the display screen toward the BFR. The Examiner states that Kimiya's electron gun satisfies all of the claimed structural limitations.

Kimiya's electron includes at least four electrodes in a main electron beam focusing lens including first, second, third and fourth sequentially positioned grids, where a middle first voltage is applied to the first grid, an anode voltage is applied to the fourth grid, and substantially the same

second and third voltages which are higher than the middle first voltage and lower than the anode voltage are applied to the second and third grids which are connected by a resistor. An asymmetric lens is established between the adjacent second and third grids and a voltage which changes synchronously with the electron beam magnetic deflection field is applied to the first grid within the focusing lens. This arrangement is intended to correct for electron beam spot astigmatism caused by the magnetic deflection yoke in the peripheral region of the display screen in the form of a halo extending in a line perpendicular to the beam spot, i.e., sideways expansion of the spot. See Abstract; column 2, lines 19-24; and column 5, lines 20-50.

In the electron gun shown in FIGS. 7A and 7B of Kimiya, discussed in the portion of the specification relied upon by the Examiner, the beam forming region (BFR) includes a first thin grid G1, a second thin grid G2, and the lower end of a third grid G3 in facing relation to the second grid. Kimiya's BFR is conventional and is similar to the BFR GE in the prior art electron gun illustrated in FIG. 3 of Kimiya which further includes a beam focusing lens QL and a final focusing lens EL as discussed in column 2, lines 3-18. In Kimiya, the electron beam passing apertures located in an electrostatic lens do not "decrease in size in proceeding in a direction from the display screen toward said BFR," as claimed. Rather, the electron beam passing apertures in Kimiya change size within the BFR itself. In Kimiya's BFR shown in FIGS. 7A and 7B, the size of the beam passing apertures in proceeding from the lower end of the third grid G3 to the second grid G2 decrease in diameter. However, in the electron gun's electrostatic lens comprised of the high end of the third grid 3, the fourth grid 4 and the fifth grid 5, all of the beam passing apertures have the same diameter as shown in FIGS. 7A and 7B. Kimiya corrects for electron beam astigmatism caused by beam deflection over the display screen as described at column 4, line 60 -

column 5, line 27, by maintaining the focusing lens main plane (hypothetically the lens center, or the cross point between the emitted beam track and the beam track radiated onto the display screen) with little deviation in the horizontal and vertical directions at the peripheral regions of the screen for reducing the phenomenon of sideways deviation of the election beam at the peripheral region of the screen in providing a more rounded electron beam spot on the screen. This is shown schematically in FIG. 6 for comparison with the existing problem encountered in deflecting the beam in the horizontal direction as shown in FIG. 5. This approach is fundamentally different from Applicants' invention which increases electron beam focusing sensitivity without increasing the dynamic focus voltage or beam spot aberration on the CRT's display screen or the out-of-focus effects on the video image by providing an electrostatic lens of the electron gun with progressively reduced electron beam passing aperture size in proceeding from the display screen toward the gun's BFR. The pending claims recite an electron gun having an electrostatic lens with plural spaced grids, wherein apertures in these grids decrease in size in proceeding in the direction from the CRT's display screen toward the electron gun's BFR for increasing focusing sensitivity of the electrostatic lens on the electron beam while decreasing the required focus voltages. This feature of Applicant's invention is not disclosed or even suggested in Kimiya.

The Examiner relies upon the combination of Kimiya and Chen in rejecting claims 13-15 as being unpatentable under 35 U.S.C. §103(a). Chen is similar to the Kimiya reference in that Chen discloses a BFR incorporating a G1 control grid and a G2 screen grid having electron beam passing apertures smaller in diameter than the beam passing apertures within the electron gun's beam focus lens 241 such as shown in the sectional view of FIG. 20. In all of the electron gun embodiments disclosed in Chen, the electron beam passing apertures are of equal diameter within

the electron gun's focus lens. Similar to Kimiya, Chen also addresses the problem of electron beam astigmatism, but corrects for this source of video display degradation not by progressively reducing electron beam passing aperture size in the electron gun's focus lens as in the claimed invention, but rather by providing an electrode having outer beam passing apertures shaped to create field-strength-dependent asymmetric outer beam focusing fields to produce partial dynamic convergence, with the dynamic convergence effects of the yoke, the focusing lens portion, and the astigmatism correcting lens portion (referred to above) , combined additively. See Abstract. Chen accomplishes this by providing notches or laterally extending portions in the two outer beam passing apertures within the focusing lens such as shown in FIGS. 19-27. The two outer beam passing apertures are thus provided with profile distortions which are symmetrical about the electrode horizontal and vertical axes through the center opening, but are asymmetrical about respective vertical axes through the outer beam openings. These distortions to the electrode beam passing openings, or apertures, take the form of an outwardly extending opening enlargement, such as a notch, for example, as shown in FIGS. 25-27. Chen states in column 19, lines 13-19, that the relatively lower potential electrode 172 has an aperture pattern which creates symmetrical field components for the outer beams 174, 178 having the effect of bending or refracting the two outer electron beams outwardly away from the center electron beam. Thus, Chen does not disclose an arrangement for correcting for electron beam astigmatism by incorporating electron beam passing apertures in the electron gun's focusing lens of decreasing size in proceeding in a direction from the display screen toward the electron gun's BFR. Nor does the Chen approach increase the focusing sensitivity of the electrostatic lens on the electron beam while decreasing the focus voltages, as claimed.

With this amendment, all of the pending claims are believed to define patentable matter. Therefore, reconsideration and allowance of the pending claims is respectfully solicited.

Respectfully submitted,

Date: NOVEMBER 17, 2003

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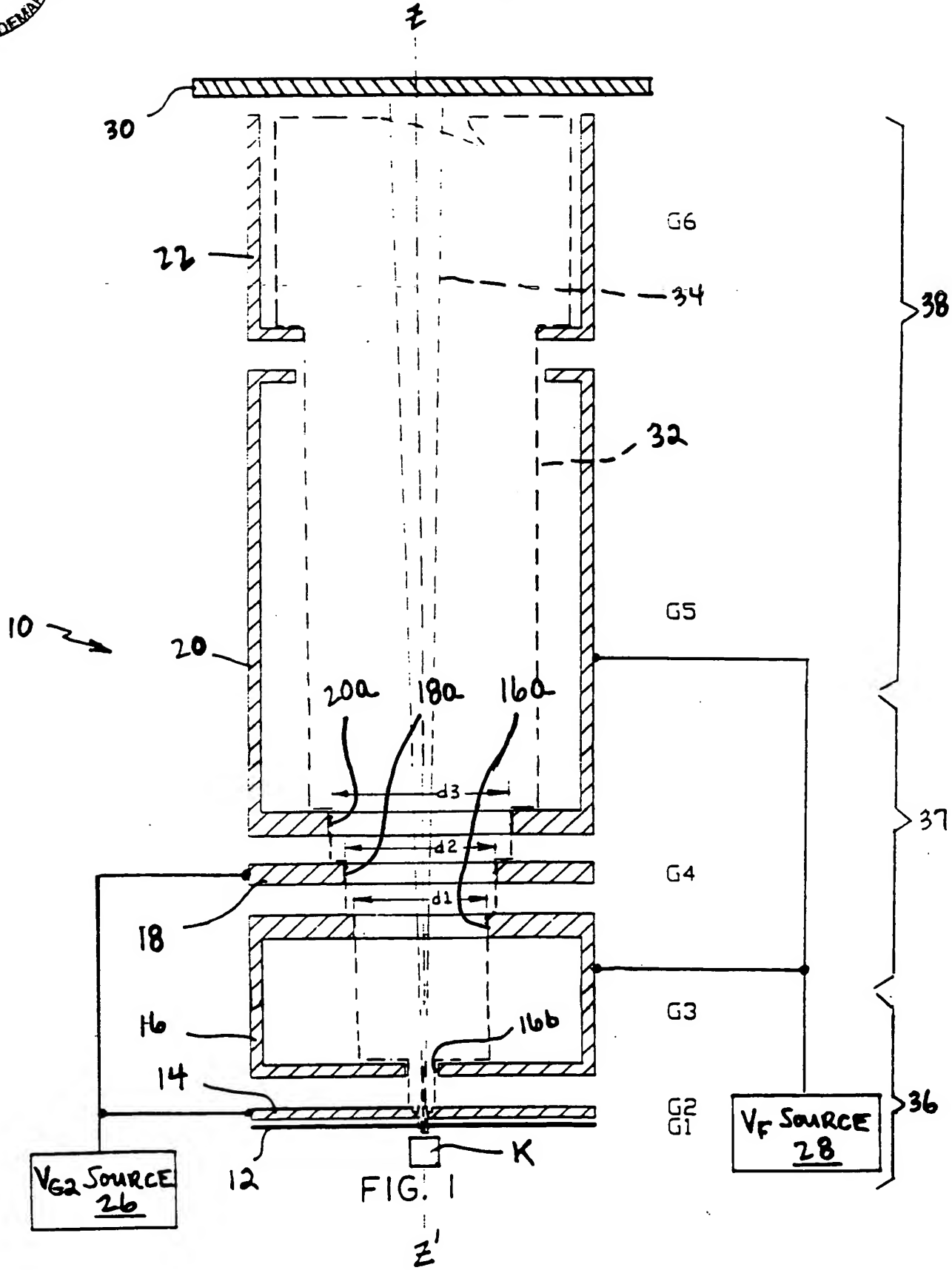

FIG. 1